

Claims

1. An isolated polynucleotide capable of selectively hybridizing to a porcine circovirus Type II (PCVII) nucleotide sequence, wherein the polynucleotide comprises at least about 8 contiguous nucleotides derived from, or complementary to, a PCVII sequence depicted in Figures 4A-4C (SEQ ID NO:1, SEQ ID NO:11 and SEQ ID NO:12).

2. The polynucleotide of claim 1, wherein said polynucleotide is at least 10 nucleotides in length.

3. The polynucleotide of claim 1, wherein said polynucleotide is at least 15 nucleotides in length.

4. The polynucleotide of claim 1, wherein said polynucleotide is at least 20 nucleotides in length.

5. The polynucleotide of claim 1, wherein said polynucleotide comprises a sequence having at least about 85% identity to a PCVII sequence depicted in Figures 4A-4C (SEQ ID NO:1, SEQ ID NO:11 and SEQ ID NO:12), or a fragment thereof comprising at least about 75 contiguous nucleotides.

6. The polynucleotide of claim 5, wherein said polynucleotide comprises a PCVII sequence selected from the group consisting of PCVII 412 (SEQ ID NO:1), PCVII 9741 (SEQ ID NO:11) and PCVII B9 (SEQ ID NO:12).

7. A polynucleotide encoding an immunogenic porcine circovirus Type II (PCVII) polypeptide having at least about 85% identity to a polypeptide selected from the group consisting of a polypeptide derived from (a)

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open reading frame (ORF) 1 (SEQ ID NO:3), (b) ORF 2 (SEQ ID NO:9), (c) ORF 3 (SEQ ID NO:7), (d) ORF 4 (SEQ ID NO:20), (e) ORF 5 (SEQ ID NO:21), (f) ORF 6 (SEQ ID NO:5), and (g) immunogenic fragments of (a)-(f) comprising at least about 5 amino acids.

8. The polynucleotide of claim 7, wherein the polynucleotide encodes an immunogenic PCVII polypeptide having at least about 85% identity to a polypeptide derived from ORF 6 (SEQ ID NO:5), or immunogenic fragments thereof comprising at least about 5 amino acids.

9. The polynucleotide of claim 8, wherein the polynucleotide encodes the polypeptide of ORF 6 (SEQ ID NO:5).

10. A recombinant vector comprising:
(a) a polynucleotide according to claim 1; and
(b) control elements that are operably linked to said polynucleotide whereby a coding sequence within said polynucleotide can be transcribed and translated in a host cell, and at least one of said control elements is heterologous to said coding sequence.

11. A recombinant vector comprising:
(a) a polynucleotide according to claim 5; and
(b) control elements that are operably linked to said polynucleotide whereby a coding sequence within said polynucleotide can be transcribed and translated in a host cell, and at least one of said control elements is heterologous to said coding sequence.

12. A recombinant vector comprising:
(a) a polynucleotide according to claim 7; and

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(b) control elements that are operably linked to said polynucleotide whereby a coding sequence within said polynucleotide can be transcribed and translated in a host cell, and at least one of said control elements is
5 heterologous to said coding sequence.

13. A recombinant vector comprising:
(a) a polynucleotide according to claim 8; and
(b) control elements that are operably linked
10 to said polynucleotide whereby a coding sequence within said polynucleotide can be transcribed and translated in a host cell, and at least one of said control elements is heterologous to said coding sequence.

15 14. A recombinant vector comprising:
(a) a polynucleotide according to claim 9; and
(b) control elements that are operably linked to said polynucleotide whereby a coding sequence within said polynucleotide can be transcribed and translated in
20 a host cell, and at least one of said control elements is heterologous to said coding sequence.

15. A host cell transformed with the recombinant vector of claim 10.

25 16. A host cell transformed with the recombinant vector of claim 11.

17. A host cell transformed with the
30 recombinant vector of claim 12.

18. A host cell transformed with the recombinant vector of claim 13.

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19. A host cell transformed with the recombinant vector of claim 14.

20. A method of producing a recombinant PCVII polypeptide comprising:

(a) providing a population of host cells according to claim 15; and

(b) culturing said population of cells under conditions whereby the PCVII polypeptide encoded by the coding sequence present in said recombinant vector is expressed.

21. A method of producing a recombinant PCVII polypeptide comprising:

(a) providing a population of host cells according to claim 16; and

(b) culturing said population of cells under conditions whereby the PCVII polypeptide encoded by the coding sequence present in said recombinant vector is expressed.

22. A method of producing a recombinant PCVII polypeptide comprising:

(a) providing a population of host cells according to claim 17; and

(b) culturing said population of cells under conditions whereby the PCVII polypeptide encoded by the coding sequence present in said recombinant vector is expressed.

23. A method of producing a recombinant PCVII polypeptide comprising:

(a) providing a population of host cells according to claim 18; and

(b) culturing said population of cells under conditions whereby the PCVII polypeptide encoded by the coding sequence present in said recombinant vector is expressed.

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24. A method of producing a recombinant PCVII polypeptide comprising:

(a) providing a population of host cells according to claim 19; and

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(b) culturing said population of cells under conditions whereby the PCVII polypeptide encoded by the coding sequence present in said recombinant vector is expressed.

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25. Protein produced by the method of claim

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26. Protein produced by the method of claim

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27. Protein produced by the method of claim

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28. Protein produced by the method of claim

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29. Protein produced by the method of claim

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30. An immunogenic porcine circovirus Type II (PCVII) polypeptide having at least about 85% identity to a polypeptide selected from the group consisting of a polypeptide derived from (a) open reading frame (ORF) 1 (SEQ ID NO:3), (b) ORF 2 (SEQ ID NO:9), (c) ORF 3 (SEQ ID NO:7), (d) ORF 4 (SEQ ID NO:20), (e) ORF 5 (SEQ ID

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NO:21), (f) ORF 6 (SEQ ID NO:5), and (g) immunogenic fragments of (a)-(f) comprising at least about 5 amino acids.

5 31. The polypeptide of claim 30, wherein the polypeptide has at least about 85% identity to a polypeptide derived from ORF 6 (SEQ ID NO:5), or immunogenic fragments thereof comprising at least about 5 amino acids.

10 32. The polypeptide of claim 31, wherein the polypeptide has the sequence of the polypeptide encoded by ORF 6 (SEQ ID NO:5).

15 33. Antibodies raised by the polypeptide of claim 30.

20 34. Antibodies raised by the polypeptide of claim 31.

 35. Antibodies raised by the polypeptide of claim 32.

25 36. A composition comprising an immunogenic PCVII polypeptide according to claim 30 and a pharmaceutically acceptable vehicle.

30 37. A composition comprising an immunogenic PCVII polypeptide according to claim 31 and a pharmaceutically acceptable vehicle.

35 38. A composition comprising an immunogenic PCVII polypeptide according to claim 32 and a pharmaceutically acceptable vehicle.

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39. The composition of claim 36 further comprising an adjuvant.

40. A method of producing a composition
5 comprising providing an immunogenic PCVII polypeptide according to claim 30 and combining said polypeptide with a pharmaceutically acceptable vehicle.

41. A method of treating or preventing PCVII
10 infection in a vertebrate subject comprising administering to said subject a therapeutically effective amount of a composition according to claim 30.

42. A method of detecting porcine circovirus
15 Type II (PCVII) antibodies in a biological sample comprising:

(a) providing a biological sample;
(b) reacting said biological sample with an
immunogenic PCVII polypeptide according to claim 30,
20 under conditions which allow PCVII antibodies, when present in the biological sample, to bind to said PCVII polypeptide to form an antibody/antigen complex; and
(c) detecting the presence or absence of said
complex,

25 thereby detecting the presence or absence of PCVII antibodies in said sample.

43. An immunodiagnostic test kit for detecting
PCVII infection in a vertebrate subject, said test kit
30 comprising an immunogenic PCVII polypeptide according to claim 30, and instructions for conducting the immunodiagnostic test.

44. A nucleic acid hybridization assay for detecting PCVII homologous sequences in a biological sample comprising:

5 (a) incubating the biological sample with a polynucleotide according to claim 1 under conditions which promote the formation of nucleic acid complexes between the polynucleotide and PCVII nucleic acid present in the biological sample; and

10 (b) detecting the complexes containing the polynucleotide.

45. The assay of claim 44 wherein said polynucleotide is labeled, and the complexes are detected by detection of the presence of the label.

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46. The assay of claim 44, wherein said detecting comprises using two PCVII nucleic acid specific probes wherein the two probes define an internal region of the PCVII nucleic acid and each probe has one strand containing a 3'-end internal to the region, converting the nucleic acid/probe hybridization complexes to double-strand probe-containing fragments by primer extension reactions,

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25 amplifying the number of probe-containing fragments by successively repeating the steps of (i) denaturing the double-strand fragments to produce single-strand fragments, (ii) hybridizing the single strands with the probes to form strand/probe complexes, (iii) generating double-strand fragments from the strand/probe complexes in the presence of DNA polymerase and all four deoxyribonucleotides, and (iv) repeating steps (i) to (iii) until a desired degree of amplification has been achieved,

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identifying the amplification products.

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47. An immunodiagnostic test kit for detecting
PCVII infection in a vertebrate subject, said test kit
comprising a polynucleotide according to claim 1, and
instructions for conducting the immunodiagnostic test.

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